



The Future Of Public Transport

**Investing in a frontline service
for frontline workers**



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INTRODUCTION

Public transport, like so many other sectors, has been severely impacted by restrictions put in place to contain the spread of COVID-19. Although these restrictions have varied from month to month and from city to city, they have in almost all cases resulted in reduced movement. People who can work from home have been asked to do so and we have all been required to reduce trips to meet family and friends or for leisure and shopping. At the same time, urban public transport is based on large numbers of people gathering in restricted spaces. This is precisely the kind of environment we have been asked to avoid to stop the spread of COVID-19.

Fewer people using public transport means fewer ticket sales and reduced revenues. In other sectors, lower revenues would be addressed through cost cutting. These may include closures, reduced service standards, job losses and delayed investments.

Public transport isn’t like other sectors. It has played and continues to play a key role in keeping society moving even during this current crisis. Public transport is a vital tool in getting us out of the crisis and promoting a green and just recovery. In the longer term, investment in public transport will help to avert future crises resulting from global heating.

Public transport keeps society moving while the crisis is still ongoing

While some people can work from home in the current crisis, the fact remains that a significant percentage are still having to travel into the workplace. These include doctors and nurses working in hospitals, carers looking after older people, teachers educating our children and workers making sure there is food on our shop shelves to buy. Many of them will be relying on

public transport to get into work, while others are depending on public transport to access healthcare, shop for food, or care for elderly relatives. While social distancing means our public transport can carry fewer people than in pre-pandemic times, the need for the service remains. Public transport workers themselves are frontline workers and get other key workers to their jobs. In a crisis, we are all depending on public transport, whether we are direct users or not.

Public transport will help get us out of this crisis, as part of a green and just recovery

The pandemic has caused a rise in unemployment. As society starts to re-open, public transport can play a major role in supporting a green and just economic recovery and help people back into work. A strong public transport system increases access to employment and education opportunities without increasing costs.

While technology means many employees will continue to work from home, the need for workers to travel to reach employment will continue. A strong public transport system increases employers’ access to a large number of qualified workers. Public transport doesn’t only get people to work, it creates jobs too. There are a wealth of good, green, long-term jobs within the transport sector, including opportunities to strengthen women’s employment¹, while city initiatives to expand public transport networks will create construction jobs as we ‘build back better’. Further, public transport reduces drags on the economy like congestion, poor air quality and unreliable journey times for deliveries, and reduces the overall costs of doing business in a city, leading to new jobs across a range of sectors.

Public transport is key to the #futurewewant

Strong public transport networks are crucial to social justice and equality. They enable affordable

access to the economic, social and cultural opportunities offered by cities especially for those who cannot afford to own a vehicle. They also underpin all ambitious climate action in urban transport.

Yet public transport is under threat

Without revenues to cover operational costs, public transport system operators are forced to introduce service cuts. This results in less frequent transport services, a loss of night time and weekend services, or routes cut altogether. Transit workers - frontline workers - are losing their jobs and their livelihoods. This creates a domino effect as other essential workers - such as hospital staff, carers and teachers - find it harder and more expensive to get to their work. Alongside cuts, public transport expansion is being delayed. The expansion of transport infrastructure creates jobs in construction, meaning many potential jobs are not being realised. New public transport links that would

have connected people to jobs and education, aren't being built. Cities are missing out on new jobs across all kinds of sectors that are created when employers are better connected to a large pool of skills.

The reduction in public transport ridership since the COVID-19 crisis does not signal that the value of these systems has decreased. On the contrary, cities struggle to function without a well-resourced public transport system. Further, reductions in public transport service levels and coverage will impact many users and reduce accessibility – resulting in decreased access to opportunities, jobs, and services for workers, along with decreased access to workers for employers. The functions and benefits of living in cities will disappear if we reduce reliable public transport services.



CHAPTER 2

PUBLIC TRANSPORT WILL MOBILISE THE GREEN AND JUST RECOVERY



The COVID-19 pandemic has resulted in immense suffering and hardship in our cities. It has exposed and exacerbated wider social and economic inequalities and is fundamentally altering societies everywhere. We will feel the reverberations in our cities for years to come.

The measures taken to contain the spread of COVID-19 are estimated to have wiped out 400 million full-time jobs in the second quarter of 2020 alone, resulting in a 14% contraction in working hours compared with pre-crisis levels ². As a consequence of the pandemic, an estimated 100 million people living in cities could fall into poverty, with as many as 71 million falling into extreme poverty ³ with urban women, minority and vulnerable groups being most at risk ⁴.

The pandemic has not affected people equally. COVID-19 has exposed the existing stark inequalities in our cities and in different parts of the world. It has visited greater destruction on those with the least means to adapt. These include low income communities, isolated elderly people, women and carers, under represented communities, or those living in informal settlements. If we are to emerge from COVID19 in a just and sustainable way, we must act now to change the systemic, underlying causes of inequality.

Overall, the crisis has exposed how vulnerable we are to major global shocks. This is a critical warning. The global consequences of climate breakdown and the breach of other planetary boundaries are set to become an even more severe threat than the COVID-19 pandemic. We must do much more to adapt our cities to meet the challenges of health and climate crises to come and to increase the resilience of our fundamental services and infrastructure.

The C40 Mayors Taskforce For A Green And Just Recovery was convened in 2020 to make recommendations on how cities and city-dwellers can recover swiftly from the health and economic

crisis of COVID-19. They call on national and regional governments, financial institutions, unions, youth, businesses and city dwellers to join and support their efforts. The taskforce shows how in their roles as city leaders, mayors can ensure the world turns this tragedy – which has caused so much hardship and pain – into an opportunity for a better tomorrow.

C40 mayors envision a future with jobs and an inclusive economy for all. They want resilient and equitable communities, healthy people and a thriving planet.

Fundamental to this vision is a sustainable, efficient and safe public transport system.

Governments must use stimulus funds to make public transport more accessible, reliable, frequent, affordable, well integrated, safe and resilient to future crises in order to keep our cities' air clean and to prioritise the health of city residents.

Working with the private sector, governments must also make it easier for cities to procure electric buses while reallocating road space to public transport, alongside developing and investing in cycling and pedestrian infrastructure, and electric-vehicle charging infrastructure. This investment will help cities maintain and enhance some of the successful air quality, climate and road safety improvements introduced during lockdown and support the transition of all remaining road vehicles to zero emissions.

Collaboration is key to realising the mayors' vision for a green and just recovery.

In our call for action on public transport, C40 is partnering with The International Transport Workers' Federation (ITF), uniting transport workers' unions in 150 countries and representing more than 20 million transport workers.

2.1 Jobs and an inclusive economy: Support and lift up essential workers and create new, good, green jobs fast.

Frontline workers are not just doctors and nurses. They are also those who care for the elderly and teach our children. The pandemic has shown that public transport staff are frontline workers too. They ensure those who still have to travel to work, can get to work, and that everyone has access to healthcare and other essential services.

We recognise the profound value and contribution public transport workers have made to our cities. There is a crucial need to protect jobs in what is a vital public service. In a crisis like this one we are all dependent on a strong public transport system.

Funding cuts to, and neglect of, our public transport system risks service reductions and job losses over the next decade. Today, 7.3 million workers are formally employed in public transport operations globally and, in a number of countries, this number is further increased by informal workers. In the African and Latin American regions, informal jobs may represent up to 30-40 per cent of the total number of transport jobs ⁵.

In this research, C40 has compared public transport job creation under a Public Transport Neglect scenario and a Green Recovery scenario in four model cities that represent cities with different levels of income and public transport mode shares. In these four model cities, C40 research estimates that a Green Recovery would generate between 6 and 10 times as many public transport jobs by 2030, compared to a Public Transport Neglect scenario, in three out of four model cities ⁶. In wealthier, higher private vehicle use cities ⁷, the estimated job creation potential is significantly higher as a result of the very low public transport mode share in 2020 and higher transport emissions, meaning the scale of public transport investment to meet a 1.5 degree

C40 Mayoral Principles of a green and just recovery in public transport

- The recovery from COVID-19 should not be a return to 'business as usual' because that is a world on track for 3C or more of overheating.
- The recovery must be guided by an adherence to public health and scientific expertise, in order to ensure the safety of those who live in our cities.
- Excellent public services, public investment and increased community resilience will form the most effective basis for the recovery
- The recovery must address issues of equity exposed by the impact of the crisis – for example workers now recognised as essential should be celebrated and compensated accordingly. Women, in particular, have lost the greatest number of jobs and those on low incomes and single mothers will find it difficult to re-enter the economy without extra support.
- The recovery must improve the resilience of our cities and communities – this means investments should be made to protect against future threats and to support those people most impacted by climate and health risks, such as communities living in informal settlements.
- Climate action can help accelerate economic recovery and enhance social equity through the use of new technologies and the creation of new industries and new jobs
- A commitment to do everything in city governments' power to ensure the recovery from COVID-19 is healthy, equitable and sustainable
- A commitment to use C40 Mayors' collective voices and individual actions to ensure national governments invest in cities to deliver an economic recovery that is healthy, equitable and sustainable
- A commitment to use the collective voices of C40 Mayors and individual actions to ensure international and regional institutions invest directly in cities to support a healthy, equitable and sustainable recovery

pathway is greater along with the potential job creation opportunity.

Across almost 100 C40 cities, and their supply chains, a Green Recovery is estimated to generate 4.6 million public transport jobs between 2020 and 2030⁸. Scaled up to cities around the world would mean tens of millions of new good green jobs.

At a time of mass unemployment and economic hardship in many parts of the world, generating these green, new jobs today will benefit millions of families tomorrow. These are good, green jobs essential to moving our cities towards a cleaner, healthier future.

Previous C40 research has shown that sustainable transport offers good employment potential, with investment in transit infrastructure generating 30 per cent more jobs than building roads. A 50 per cent switch to electric vehicles could also generate 10 million jobs.⁹ We therefore need to accelerate investment in new and upgraded public transport infrastructure alongside investment in zero emission bus fleets. By changing the current paradigm, greater diversity in the work force can be introduced with opportunities for women, ethnic minorities and people with disability to find secure employment and also better reflect the needs of those who use public transport.

This will both deliver those new and green jobs and set us firmly on a path towards a zero-carbon economy.

Beyond the jobs directly related to the provision of public transport services, better public transport can reduce the cost of doing business in a city – again stimulating economic recovery from the COVID-19 pandemic. Effective public transport networks give employers access to a larger pool of potential employees, increasing the chances they can find the skills they need. It contributes to managing traffic congestion, and

reduces the costs of transporting people, goods and service delivery.

Some estimates suggest that these productivity or effectiveness benefits might generate twice as many new jobs than those directly within transit operations.¹⁰

2.2 Resilience and equity: Providing fundamental public services for all underpins a fair society and a strong economy resilient to future shocks.

COVID-19 has exposed a lack of resilience in the face of extreme events. It has exposed the fragility and interconnectedness of urban systems.

During the course of the pandemic, public transport has been dealt a severe blow, despite it providing a vital service at the heart of sustainable, connected cities.

Cities are already seeing signs of an increase in car traffic as trust in public transport services starts to falter. A response to COVID-19 that does not centre the importance of public transport to cities is unsustainable – reducing connectivity, increasing pollution and congestion, and exacerbating existing inequalities.

Our research shows that a recovery scenario which neglects public transport systems risks shifting us further away from the trajectory we need to be on to achieve the climate ambitions laid out in the Paris Agreement.

In Higher GDP, Higher Private Vehicle Use cities, the transport sector is a significant source of emissions and this means these cities need to do more to meet their climate commitments. Yet, this research has found that if these cities neglect public transport now, they risk making no gains in reducing their GHG emissions in the ten years to 2030.

An alternative scenario which prioritises investment in public transport for a green and just recovery – in line with commitments already made by C40 cities in their Climate Action Plans (CAPs) to meet a 1.5 Pathway – would reduce 2030 emissions from urban transport in C40 cities by over half, compared to 2020.

A Green Recovery would reduce C40 cities' cumulative GHG emissions from the transport sector by 3.3 GtCO₂e over the coming decade, compared to a Business as Usual (BAU) development, which represents more than all GHG emissions that C40 cities emit in one year (based on 2017 figures).

The pandemic has brought into sharper relief the inequalities that exist in all of our cities. It has demonstrated that the poorest and most vulnerable are often exposed to greater risk and find it harder to access opportunities for employment and education as well as essential services.

Investing in fundamental services, such as public transport, strengthens resilience, equity and sustainability in our cities. A resilient, well resourced public transport system not only underpins all ambitious climate action, it will also increase the ability of cities to deal with future shocks. Protecting and expanding public transport is essential to build a more fair and just society as it ensures fair access to essential services and jobs to all city dwellers.

This investment in public transport can speed up the recovery and be a source of jobs and economic prosperity to build strong and thriving economies in cities. To ensure this, green and just recovery programmes should provide equitable access to equal employment opportunities, increase women's participation in the labour force and develop appropriate regularisation mechanisms and social coverage for essential informal workers in the sector.

2.3 Health and wellbeing:

Give space back to people and nature, rethink and reclaim our streets, clean our air and create liveable local communities.

A green and just recovery from the COVID-19 pandemic means maintaining access to opportunities, reclaiming our streets and cleaning our air. To do this, we must reduce private vehicle use while providing an alternative through public transport, walking and cycling infrastructure.

Our research shows that cuts to public transport and associated increases in private car use results in increased air pollution levels in all cities compared to a green recovery. It is therefore essential to encourage a mode shift from private vehicles to public transport, as well as encouraging electrification of the public transport fleet to improve air quality.

If we fail to do this, PM_{2.5} air pollution concentration could increase by up to five per cent in some of modelled cities by 2030. In contrast, investing in a green and just recovery can reduce air pollution coming from transport by 45 per cent in cities with low private vehicle use, and 14 per cent in cities with high private vehicle use, compared to a Public Transport Neglect scenario. A significant part of these air quality improvements will be due to vehicle electrification.

Finally, increasing the mode share of public transport also improves people's health by increasing active mobility. While cars, taxis and motorcycles bring commuters door-to-door, public transport provides someone the opportunity for a few minutes of walking between stations. This research has shown that even 6 minutes of walking to and from a station twice a day on a workday commute (amounting to a daily total of 24 minutes of walking) delivers significant



increases in life expectancy and combats obesity, type 2 diabetes, stroke, cardiovascular diseases, breast and colon cancer, as well as depression and dementia.

CHAPTER 3

WHAT HAS BEEN THE IMPACT OF COVID-19 ON PUBLIC TRANSPORT?



3.1. Global public transport systems are reeling from the impact of the pandemic

Public transport systems around the world have seen big reductions in ridership as a result of restrictions introduced to combat the spread of COVID19

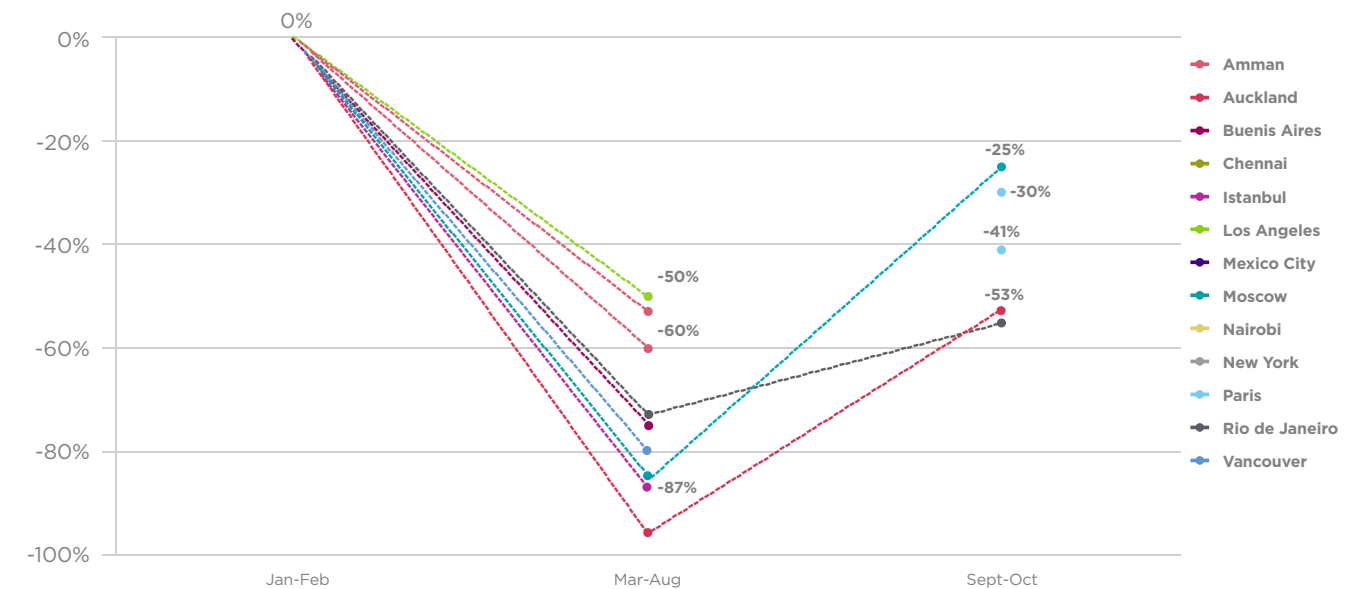
The severity of the restrictions have varied from month to month and from city to city. In almost all cases, those restrictions resulted in reduced movement of people as anyone who can work from home has often been asked to do so. The pandemic and the government's attempts to mitigate this crisis have an uneven impact on the population ¹¹. Those who are already disadvantaged are often less likely to have remote friendly jobs and thus are hit more severely ¹². Furthermore, lower-income economies have a lower share of jobs that can be done at home ¹³. Other workers have lost their jobs as a result of the economic downturn and are no longer commuting using public transport services.

Commuting to and from work typically accounts for one third of the trips made in cities. The rest are trips we make to see family and friends, for leisure and shopping, and to access essential services. The pandemic restrictions means a reduction in the number and length of these kinds of trips.

Urban public transport is based on large numbers of people gathering in restricted spaces – precisely the kinds of environments we have been asked to avoid to stop the spread of the coronavirus. As a result, social distancing regulations have been implemented on many public transport systems to decrease transmission risk. This in turn decreases the system's carrying capacity.

Some public transport riders have opted to buy private vehicles for safe travel, despite sufficient evidence to demonstrate that, when measures recommended by the health authorities are implemented, the risk of Covid-19 transmission on public transport is very low.¹⁴ These and other factors mean the use of public transport ridership continues to be substantially reduced compared to pre-pandemic levels as seen in the graph below:¹⁵

Max and current % drop in public transport ridership



Source: <https://www.c40knowledgehub.org/artivle/COVID-19-Active-and-Sustainable-Mobility-Explorer>

Decreased fare revenues and increased operating costs have led to funding gaps for many public transport systems

Farebox revenue can make up a large proportion of total revenue for many public transport systems. The decrease in use of public transport has therefore directly impacted this key revenue generator.

At the same time, there have been increases in operating expenditures. These include employee training, the installation of equipment to keep workers and riders safe from coronavirus, and an expanded cleaning regimens for transit vehicles and stations.

Fare revenue reductions and increased operating expenses have resulted in large deficits in 2020 and anticipated budget shortfalls for coming years.

For example:

- Public Transport operations in Greater Paris (Ile-de-France) lost an estimated €2.6 billion (US\$3.6bn) in revenue between March and September 2020 ¹⁶
- MTA in New York estimates a more than US\$6 billion deficit in 2021 and a cumulative deficit of close to US\$16 billion due to COVID-19 over a 5-year period ¹⁷
- Europe-wide Farebox revenue losses were estimated to be €40 billion (US\$48bn) in 2020
- Transit systems in Spain lost €250 million per month in fare revenues, while in Italy Farebox revenue losses were estimated to be €1.5 billion (US\$1.8bn) in 2020 ¹⁸.

Public transport systems are reducing services to balance their budgets

To close the gap, many transit systems have been forced to reduce their services. Some have cut bus service frequency or suspended bus routes altogether. Others have closed metro stations, or

eliminated late weekend or night services. Such cuts leave shift workers stranded. In cities with a largely informal transit system dominated by private bus operators, services are being reduced to only the most profitable routes leaving people stranded, especially the poor who live on the urban periphery.

- Almost two thirds (65 per cent) of transport agencies in the United States reduced public transport services during 2020, with nearly four in ten agencies considering additional cuts to service in 2021 to reduce their budget gaps
- The Brazilian public transport sector registered an economic loss of R\$9.5 billion (US\$1.7 billion) as transport demand plunged by 80 per cent in 2020 in the country
- Rio de Janeiro's bus system saw an estimated loss of R\$500 million (US\$100 million), as their buses were operating at 62 per cent of capacity
- In South Africa, informal operator associations were offered a one-off COVID-19 bailout offer of R1.134bn (US\$75m) to the entire industry ¹⁹. This was ultimately rejected by national associations as insufficient although it opened the door for discussions between operators and national government about operational subsidy support and more formalised operations in the future.

These cuts threaten public transport workers' jobs

Essential workers rely on public transport to get to work. Many more people need public transport to access health services, food and vulnerable relatives. This means public transport staff are themselves frontline workers.

The pandemic has affected transport workers in different ways. Where transport operations are formalised, public transport agencies are generally doing everything possible to protect jobs – sometimes at the expense of reducing service and capital programmes. Yet we are

already seeing employee layoffs on public transport systems, even when they have received emergency funding as part of governments' COVID-19 response.

- Coronavirus emergency funding enabled most US transit agencies to avoid layoffs, yet 22 per cent of agencies stated they had been forced to lay off staff in 2020.
- Nearly one in every four transit agencies across the U.S. have indicated they may be forced to lay off employees going forward ²⁰
- In its worst-case scenario for 2021, the New York MTA's proposed budget includes more than 9,300 layoffs ²¹, while gap measures from New York State have pushed these layoffs to 2023 ²²
- The regional transit agency serving Vancouver (TransLink) drew up plans to lay off 1,500 transit workers in May 2020 although this was rescinded after the provincial government stepped in with support ²³

Unfortunately, in cities where transport operations are informal or operators rely entirely on fare revenues and do not receive any government subsidy, jobs and livelihoods are extremely precarious. Transport workers are vulnerable to cuts in working hours, loss of earnings or layoffs without proper social protection. In some cases, informal transport workers often have no choice but to continue to work in order to earn a daily wage despite the risk to their health or repercussions from the authorities²⁴.

- In Nairobi, more than half of all women workers in the matatu (private mini buses) industry have lost their jobs due to operators going out of business, more than men's jobs losses, with one third unable to make rent payments as a result⁴⁶.
- In South Africa, the national government required informal operators to reduce passenger loads to 70 per cent ²⁵. When operators proposed to increase passenger

fares by between 10% and 25% to make up the short fall, government eventually acceded to the industry's demand to be allowed to carry a full load of passengers.

The crisis has led to some transit agencies cutting or delaying capital investments

With uncertain future ridership and revenues, agencies are pausing plans to renew their vehicle fleets – scaling back infrastructure projects or even cancelling new BRT, metro or rail projects altogether.

- 26 per cent of North American transit agencies reported plans to pause capital projects, while over half these agencies indicated a planned reduction of service frequency in 2021²⁶
- A BRT expansion project in the Seattle region is at risk of falling behind due to COVID-19, with a \$11.5 billion affordability gap for this voter-approved project²⁷

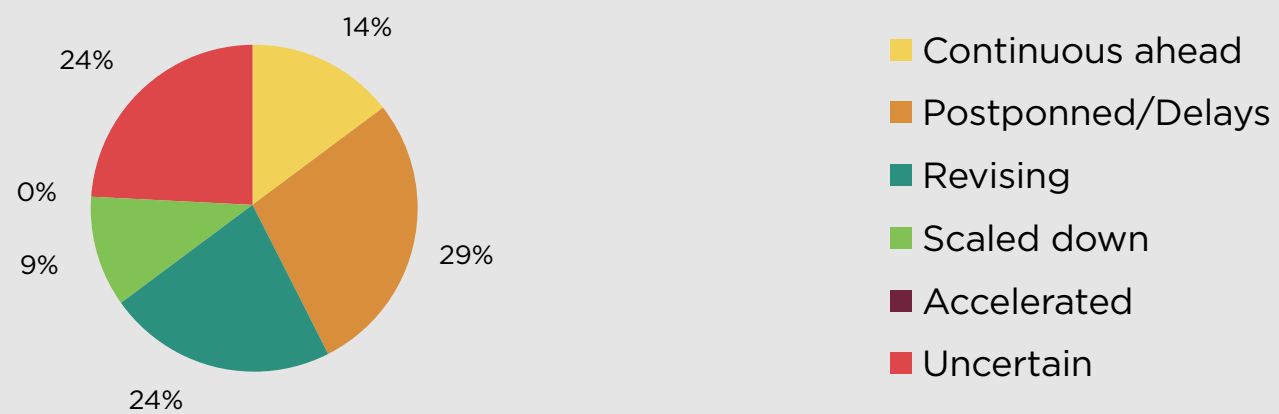
In 2020, a UITP member survey catalogued the main impacts and approaches that transit authorities used to address both short and medium financial challenges.

The results (Fig. 4) indicate that cities and their networks have seen their project pipelines affected by the pandemic – either through a revision of prioritisation, proposed reductions, or a changed assessment of their impact on the local economy. 53 per cent of those surveyed had postponed, delayed or were uncertain about their projects' future. 33 per cent were revising or scaling down transport investment projects.

3.2. What is the cost of saving public transport?

Almost all public transport systems are dealing with a reduction in the numbers of riders causing a loss of fare revenue. However, some are in a better position than others.

Expected impact to ongoing and planned investment projects



Source: UITP COVID-19: THE ECONOMIC AND FINANCIAL IMPACT TO THE PUBLIC TRANSPORT SECTOR (2021, members only)

This creates a challenge in estimating a global figure for the costs of saving our public transport systems as the funding gap varies significantly across C40 cities.

Why are some systems merely struggling, while others are facing an existential threat?

A lot depends on the extent to which a city's public transport system relies on fares to fund its service.

For example, in cities without a formalised public transport system, riders can be paying 100 per cent of the services' operational costs.

At the other extreme, a handful of cities have done away with public transport fares altogether and are instead covering operating costs through general or dedicated taxation.

The majority of cities fall somewhere in between. This means typically between 30 and 70 percent²⁸ of operating costs are covered through fares paid by the rider. The rest is then made up by a range of general or dedicated taxes (for example

property taxes, sales taxes, fuel and parking taxes, employer taxes) and supplemented by commercial incomes (for example for retail space at stations, advertising on stations and vehicles, or through the sale of property or development rights).

In general, cities that rely heavily on fares to cover operational costs, like London, are facing bigger deficits as a result of the pandemic than cities with a more diversified revenue base such as Paris.

Public transport will not only play a role in managing the ongoing crisis, it will also play a vital role in a green and just recovery from the pandemic. Public transport systems will also help cities' efforts to avert the climate crisis. This means the more important question is what is the cost of NOT saving our public transport systems?

Whatever the short term cost of taking action to protect our public transport infrastructure now will be dwarfed by the medium and long-term cost of inaction.



CHAPTER 4

WHY DO WE NEED TO PROTECT PUBLIC TRANSPORT



4.1 Public transport is a lifeline...

...for domestic workers in Latin America.



One in four working women in Latin America is a domestic worker²⁹ and women make up 95 per cent of the 17 million domestic workers in the region³⁰.

Domestic workers are dependent on public transport, with workers almost always travelling from low income neighbourhoods on the periphery of cities into middle and high income neighbourhoods spread all across the city. These are long, daily commutes that often involve multiple changes – in fact the daily commute for domestic workers in São Paulo is five hours, while in Medellín it is four hours.

In Colombia, where the average commute for domestic workers is six hours, female domestic workers travel on average 42 per cent longer than the average formalised female worker³¹. The latter

is more likely to be travelling to and from central business districts along the busiest transit routes. As well as time-consuming, these lengthy commutes cost money.

Reinalda, a domestic worker in a high-income neighbourhood in Medellín, spends nearly a third of her monthly income on transport.

The services she uses have been cut, making them less frequent and more crowded. These journeys were already dangerous for women – overcrowded buses are known spaces for sexual assault. Now Reinalda faces a new danger. She is scared of contracting COVID-19 and infecting her employers and her family members. Sometimes she instead chooses to walk for up to two hours to avoid the most crowded parts of her commute³².

... for children and carers in Europe



Almost 90 million³³ people in Europe look after children, with women often taking on more responsibility than men.

Those caring for children make journeys that tend to involve multiple stops to allow time to run errands, such as grocery shopping or the school run. These journeys take place outside peak periods when the frequency of public transport can be lower.

The quality of urban public transport can have an impact on children's development. Not only are children more sensitive to external experiences and inputs, but for caregivers the stress involved in travelling around the city on public transport can impact on the quality and amount of responsive care they can provide³⁴.

Jono, a single caregiver with three children living in Amsterdam, travels to and from home, shops, kindergarten and work on a daily basis. It takes a lot of juggling to make sure he and his children are able to reach their various daily destinations on time.

On a typical day, Jono wakes up at 6.30am. By the time he has made sure his children have had breakfast and packed their schoolbags, the family is ready to leave the house at 8am. This leaves 30 minutes to drop his youngest child off at kindergarten before arriving at work at 9am³⁵.

The rush and stress of this daily commute means access to essential childhood services has been interrupted, and access to public space and nature is restricted³⁶.

... for women in South Africa



Women are more likely to use public transport than men in South Africa³⁷. They are also more likely to need public transport to access work opportunities and vital services such as healthcare and groceries.

Under South Africa's lockdown regulations, Spaza Shops, informal convenience shops often run on local corners out of someone's home, needed permits to be able to trade. However, these permits were hard to obtain and 80 percent of these traders were forced to close. When lockdown started to ease and Spaza Shops were allowed to resume without permits, many could no longer afford to operate and food prices were higher.

Busisane from Johannesburg travels four hours a day in a shared taxi to get to her job as an insurance underwriter. Busisane has to walk some distance to complete her trip following the closure of some routes. She leaves work before dark to avoid walking in the streets alone at night³⁸.

The pandemic has meant fewer people are sharing taxis and higher transport fares. This, combined with restricted local food trade, many South Africans who relied on public transport like Busisane were forced to either travel longer distances to purchase food, paying more for travel and food, or go hungry if they could not³⁹.

... for low income households in the United States



More than one in five low income households in urban areas in the United States do not have access to a car, meaning many people are entirely reliant on public transport to access employment, education and other opportunities⁴⁰.

The poor state of some public transport systems in the US was already limiting access to jobs, opportunities, education and other services, primarily impacting low income communities⁴¹. This has been exacerbated by the COVID-19 pandemic, with public transport ridership decreasing by up to 90 per cent⁴² causing many agencies to cut vital services.

While many Americans are able to work from home, many others continue to rely on public transport to get to work⁴³. These workers are disproportionately people on low incomes working in essential services like hospitals,

supermarkets, warehouses and transport depots. Low income Black and Hispanic communities are thought to be among the hardest hit⁴⁴.

In Pittsburgh, almost 40 per cent of all public transport users like Mosi are on a low income.

Mosi works at a supermarket in Pittsburgh and is the main breadwinner for the household. During the COVID-19 pandemic, he noticed the bus to work was coming less frequently or with increased delays. When the bus did arrive, it was already full and people were unable to follow social distancing guidelines. Mosi cannot afford a car, but is considering getting one anyway. He is worried about being late for work and worried about infecting his wife, who is in the high risk group for COVID-19⁴⁵.

... for female transit workers in Kenya.



In Nairobi, less than ten per cent of people working in the matatu industry (private mini buses companies) are women and 85 per cent⁴⁶ of those who are employed in the sector are conductors – one of the lowest ranking positions in the industry.

Before the COVID-19 pandemic, 90 per cent of Kenyans would use public transport daily. However, restrictions put in place to stop the spread of the virus have affected the transport industry.

Flone Initiative, a women-led organization working to support women access to transport, carried out a rapid assessment of the impact of COVID-19 on women working in the matatu industry.

They found that half of all the women in the industry had lost their jobs. Operators have been put out of business by distancing restrictions that make it economically impossible to operate at 60% of the normal carrying capacity of 60%. Nearly all these women now found it difficult to afford food and one third had defaulted on rent payments⁴⁷.

4.2 Public transport is an enabler of opportunity

Cities thrive because they provide access to opportunities. A concentration of people in a small area reduces the cost in time and money of exchanging ideas, culture, goods and services – driving the prosperity of cities and their residents^{48 49}.

The more employment or educational opportunities urban residents have access to, the more likely it is that they will find a job to match their skills. This increases the possibility of a good wage. Accessibility to family and friends, leisure and cultural opportunities are also all essential to our broader welfare and happiness⁵⁰.

As such, anything that makes it harder to move freely around the city will decrease these opportunities both for people on public transport and people travelling alongside public transport.

Decreases in public transport services or cancelled service expansions will, of course, have a direct impact on those who use these services.

For example, riders will face longer journey times and less reliable services. This means missing out on opportunities like a better job or education in another part of the city. People who would have used planned new public transport services will also miss out on faster, more reliable journey times, as well as the chance to reduce their transport costs by driving less. Their access to job opportunities and everything else the city has to offer declines. Limited access to, and safety of, transportation disproportionately affects women and is estimated to be the greatest obstacle to women's participation in the labour market in developing countries, reducing their participation probability by 16.5 percentage points. This challenge also has a noticeable negative effect in emerging countries⁵¹.

Investment in public transport has a positive impact even on those who do not use the services. The more people who choose an alternative to driving, the less road congestion results. Congestion increases travel time and fuel costs for everyone in a city, including freight operators. That leads to rising costs of the goods and services we purchase⁵².

Every dollar invested in public transit generates \$3 in economic growth and reclaims more of the \$15 billion in productivity we lose each year to traffic congestion - Canadian Urban Transit Association estimate ⁵³.

Good accessibility is a strong driver of housing markets in cities. Places with good accessibility tend to be the most expensive to live in ^{54 55}. Affordable housing is more likely to be found in locations with poorer accessibility, meaning that those in our cities who can least afford it will bear the costs of decreased public transport services.

Even when the pandemic is over, it seems likely that those who can work from home will choose to do so more often than before. Should that happen, it provides an opportunity to re-focus public transport services away from routes taking workers to and from city centre office jobs and towards better connecting all parts of the city.

4.3 Public transport is an engine of urban economies

Just as it benefits individuals to have access to a large number of potential jobs, there are benefits for employers in having access to a broad and diverse labour pool.

Business productivity increases when it is easier to recruit staff with the right skills. Good, comprehensive public transport systems increase access across the city while also increasing the number of locations to which potential employees can commute⁵⁶.

These nodes where access is good can further enable the clustering of businesses with similar or complementary products and competencies.

This clustering of companies – often-called agglomeration – further increases the spillover of ideas and innovation that drives business productivity ⁵⁷. Even with increased levels of working from home in certain sectors, many businesses will continue to benefit from the effects of better, more connected public transport systems.

In contrast, deteriorating accessibility is a direct drag on the economy. Longer, less reliable journey times both for public transport users and private vehicle drivers as a result of increased congestion have two impacts:

- Increased costs of any business-related travel, such as the delivery of goods or related to the provision of services
- Increased costs of attracting and retaining workers in congested areas where travel times and expenses are higher⁵⁸.

There are also costs to the broader economy resulting from increased private vehicle travel. These include the health costs associated with poor air quality and noise. Public transport investment can also reduce vehicle collisions and associated insurance costs, whereas higher car use can increase the costs of death and serious injury⁵⁹.

- Every \$1 invested in public transportation generates \$5 in economic returns.
- Every \$1 billion invested in public transportation supports and creates approximately 50,000 jobs.
- Every \$10 million in capital investment in public transportation yields \$30 million in increased business sales.

- Every \$10 million in operating investment yields \$32 million in increased business sales.
- An estimated \$39 billion of public transit expenditures flow into the private sector.
- Home values were up to 24% higher near public transportation than in other areas. Hotels in cities with direct rail access to airports raise 11% more revenue per room than hotels in those cities without⁶⁰.

APTA Public Transportation Facts



4.4 Public transport is a tool for social justice

Marginalised groups – including women, people of colour, underrepresented communities, people with disabilities, people with precarious employment, youth and essential workers – often rely heavily on public transport⁶¹.

This was true before the COVID-19 pandemic and, if anything, it is even more true now. Losing access to public transportation could therefore significantly impact job opportunities and incomes for these marginalised groups:

Employment sectors most affected by COVID-19 have a disproportionate amount of women, Black, LatinX and Native American employees

- These groups have been more vulnerable to unemployment and precarious employment compared to the US population as a whole⁶²
- This is also the case in many developing country cities, where low income women have been particularly hard hit⁶³.

COVID-19 has increased job precarity for young workers

- One in six young people have stopped working since the onset of the crisis and younger workers are also more likely to be employed in occupations highly impacted by the pandemic, such as retail, catering and entertainment⁶⁴

The availability of a car and possession of a driver's license is lower for people of colour, people with lower incomes, women and elderly populations

- Even in wealthier cities with good public transport systems and relatively low car use, decreased funding for public transport will negatively impact marginalised groups⁶⁵

Initial findings regarding impacts of COVID-19 on access to transportation for people with disabilities in the US show that most public transport services have continued to exist at similar pre-COVID19 levels

- The ongoing recovery and response pose greater risk to people with disabilities due to fewer transport options if (para)transit services are decreased⁶⁶

Since the start of the COVID-19 crisis, public transport ridership has dropped across all income groups.

Ridership has dropped more sharply in higher income groups which are more likely to have more transport options, such as a privately-owned vehicle.

This can be seen in a number of US cities – for example in Boston where public transport ridership among lower income cohorts fell by 32 per cent⁶⁷, while for higher income cohorts the decrease was 51 per cent.

Similarly in Nashville, the public transport usage decrease among lower and higher incomes was 58 per cent and 77 per cent respectively⁶⁸.

Higher income groups have more options to work from home or to choose other options, such as travelling by car. In contrast, public transport is often the sole option for lower income individuals, despite them facing longer journey times and higher fares which are often the consequence of attempts to fill the funding gap. People who work night shifts are a small segment of the population on the whole but are heavily reliant on public transport. Decision-makers do not always recognise this and will cut evening services based on passenger numbers (quantity) rather than consequences for travellers (quality). These users have a different demand profile than how traditional schedules are created and deployed, highlighting a mismatch between needs and services⁶⁹.

4.5 Public transport is a powerful climate action



Prior to the COVID-19 pandemic, surface transport was one of the fastest growing sources of GHG emissions in cities worldwide and one of the leading contributors to localised air pollution. Across all C40 cities where data is available, transport is responsible for around a quarter of

overall GHG emissions. In fact, for some eighteen percent of cities where C40 holds data transport is the largest source of emissions. In 9 per cent of cities, transport makes up over half the GHG emissions.

A reliable and efficient public transport network is vital to reducing emissions from transport, both as an action in its own right and as an enabler for other ambitious actions.

Nearly all of the 1.5 degree compliant Climate Action Plans (CAPs) already produced by C40 cities contain commitments to improve and expand public transport.

Public transport can help to reduce GhG emissions from transport by replacing trips that might otherwise have been taken by private vehicles. This reduces the congestion that would have occurred from these additional trips, all while enabling densification in the city and reducing overall distances travelled.

The impact on GhG emissions by investing in and expanding public transport has been modelled.

A 2009 study in New York indicated that transport emissions in the region would be at least 30 per cent higher without Metropolitan Transportation Authority (MTA) services and that at least 18 million tons of GHG emissions per year have been saved as a result of MTA services⁷⁰.

A similar study in Montreal in 2016 indicated that the public transport system in greater Montreal saves 3.9 million tons of GHGs per year, or 55 per cent of transport emissions. For every ton of CO2 emitted by the public transport network, 20 tonnes were saved.

In addition to the direct impacts of public transport on CO2 reduction, it is important as part of a wider climate strategy.

The C40 McKinsey Focussed Acceleration Research⁷¹ indicates that a mode share for walking, cycling and public transport of between

40 and 80 per cent by 2030, depending on the city characteristics, is required for cities to be on track to meet a 1.5 degree target outlined in the Paris Agreement.

While a substantial proportion of this can be made by increasing walking and cycling trips, a strong, functioning public transport network will be needed to achieve the Paris Agreement goals.

Public transport also enables a fairer means of implementing policies that reduce overall vehicle mileage – such as Urban Vehicle Access Restrictions – by providing alternative means of travel to the privately-owned car. This can then increase the acceptability of such policies.

For example, prior to the introduction of London's congestion charge, 300 additional buses were introduced in central London to provide alternative modes of travel for car drivers⁷².

The electrification of public transport is also happening at a significantly faster pace than the electrification of private vehicles in cities. Whilst the sales of electric cars are rapidly growing, electric cars made up just 2.6% of sales in 2019 and 1 percent of global car stock.⁷³

Virtually all city light rail and metro systems now operate using electricity and great strides are being made in bus electrification.

At least eight C40 cities are currently procuring only electric buses and at least twenty nine have set ambitious targets for all new buses to be electric from 2025.

This matches the most ambitious national commitments for the phasing out of new fossil fuel cars, and is well in advance of the ambitious 2030 date set by an increasing number of countries. As the pace of bus electrification continues at a higher rate than private vehicle electrification, the resulting climate benefits of public transport over private vehicles will continue to increase.

CHAPTER 5

WHY PROTECTING AND CHAMPIONING PUBLIC TRANSPORT IS THE #FUTUREWEWANT



To better understand the impacts of different recovery patterns for public transport over the next decade, this research developed a series of scenarios.

These scenarios support a structured analysis of the likely impacts for jobs, equity, GhG emissions and urban air quality. They have been applied to four city typologies in order to understand the impact for different kinds of cities that are representative of C40's diverse membership.

Our analysis uses a combination of expert knowledge and existing research to develop assumptions for these four typologies. The assumptions have been tested using model data representative of these four model city typologies. This ensures they hold true from an emissions, air quality, and jobs creation perspective across city types.

5.1 Model Cities

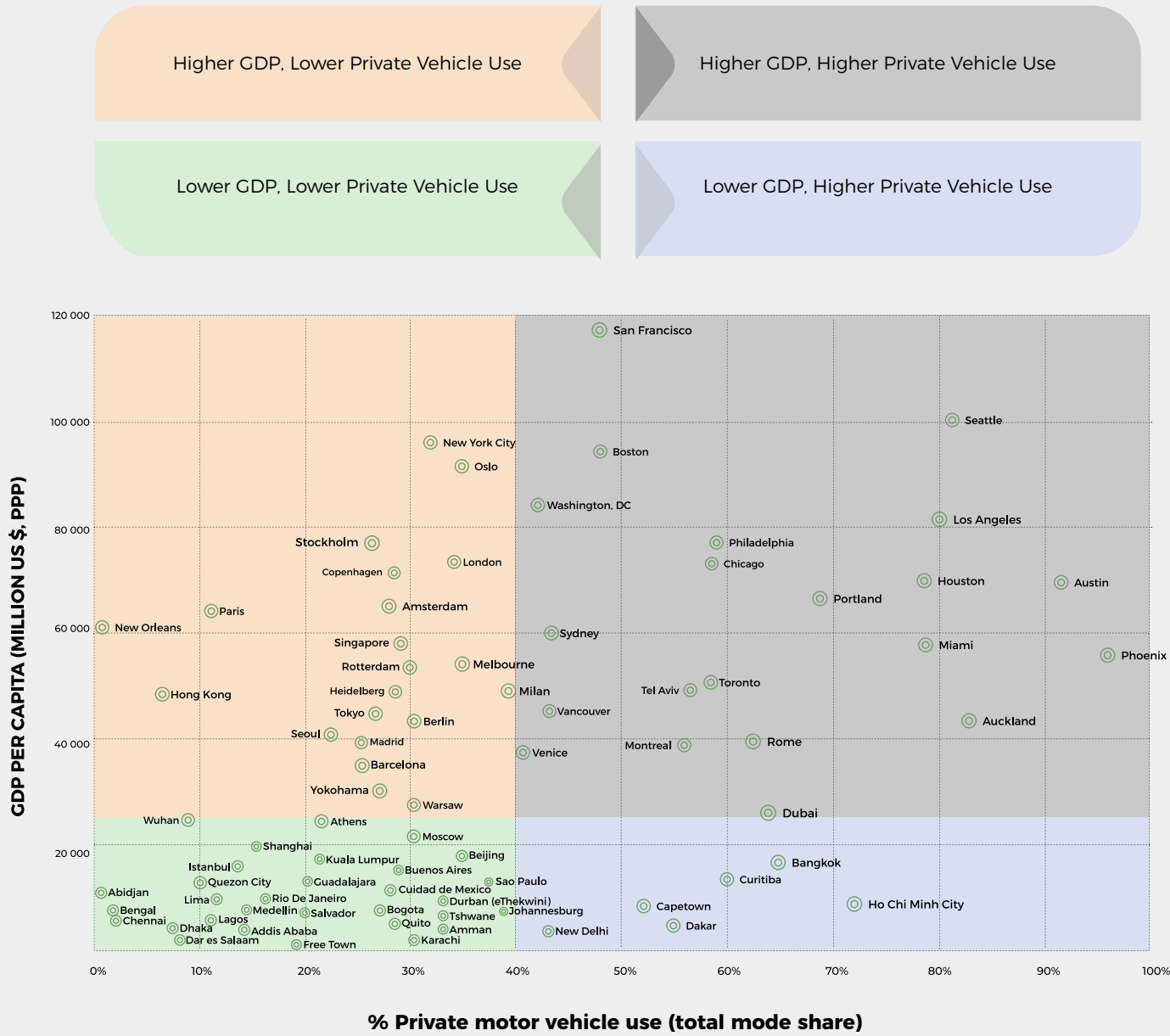
Each C40 city has a different transportation profile based on its unique geography, development patterns, traveller behaviours, governance and culture. All cities have also been impacted by the COVID-19 pandemic in different ways.

We then cross-referenced our city typologies with the six C40 global regions: North America; Europe; East and South East Asia; Latin America; South and West Asia; Africa to ensure that model cities are broadly representative of C40 cities across the world.

Recognising the diverse set of variables that exist, we developed city typologies in order to explore these more deeply using two primary parameters: GDP per capita and proportion of private vehicle use for passenger trips.

This ensured representation within the model for cities across the world, aligning with work previously undertaken in the Mayors’ Agenda For A Green And Just Recovery ⁷⁴.

Figure 1 displays C40 member cities against GDP/capita and proportion of private vehicle use, Adapted GDP and Private Vehicle Use Figure, C40 2016.



Source: Self reported CAM data

5.2 Scenario Development

The unprecedented global public transport ridership decrease seen during the COVID-19 pandemic, along with the uncertain future we now face, makes scenario planning a particularly effective method for this exercise.

While point forecasts and sensitivity analysis are effective for determining trendline trajectories, scenario planning allows for deviations in particularly uncertain assumptions. This helps to generate a better understanding of outcomes that may occur, should these assumptions take a different path than what is anticipated.

We therefore developed three scenarios to depict plausible public transport funding trajectories up to the year 2030. These scenarios build off existing scenarios developed for C40’s Case For A Green And Just Recovery and are expanded to include a scenario where public transport funding is reduced over a sustained period.

All scenarios for this work have the horizon year of 2030.

Business as usual:

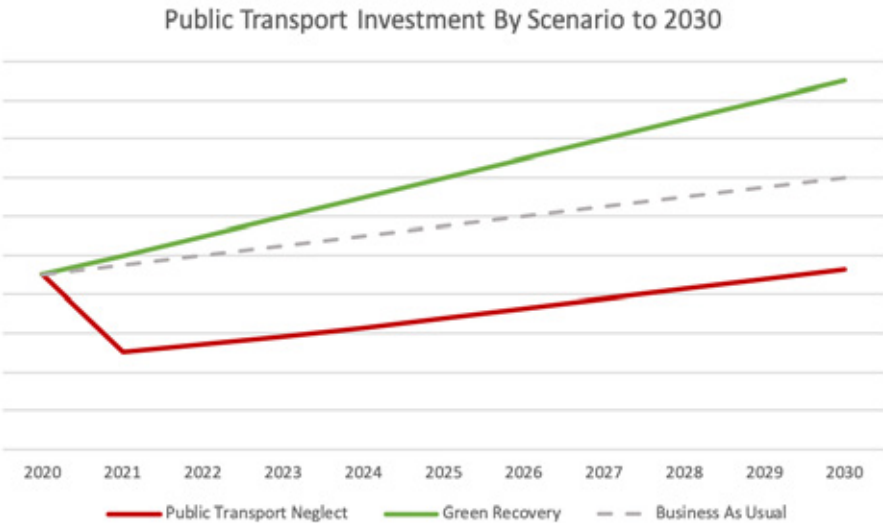
The business as usual scenario (BAU or base case) is a trendline forecast of what may happen if existing transport investment continues, with no notable change during the COVID-19 recovery. This scenario projects current levels of climate action into the future based on expected urban population and GDP growth. The BAU scenario does not take into account any significant climate action policy change or high-carbon policy change. It is a pre-COVID-19 scenario.

Green recovery:

The green recovery is a scenario in which COVID-19 recovery stimulus funding supports investment in climate action that prioritises rapid job creation and ensures C40 cities are on track to limit global warming to 1.5°C. The green recovery scenario is an aspirational, yet plausible, framing of what could be achieved through COVID-19 stimulus funding to improve the quantity and quality of public transport services. This includes providing better access, generating public transport jobs, and creating a shift away from private vehicle use.

Public transport neglect:

This scenario depicts a trajectory of decreased public transport funding between 2020 and 2030. That trajectory largely follows the current funding gap being reported by public transport systems around the world. For this scenario, it is anticipated that usage follows a similar path to the decreased services that would exist if funding gaps – caused primarily by reduced ridership and increased operating costs – are not made whole by other means of revenue or funding. Further, it assumes that senior levels of government do not answer the calls of cities and public transport operators to fill the deficit they are facing.





The 'Green Recovery' and 'Public Transport Neglect' scenarios can be seen as bookend scenarios. This recognises that the true outcome is likely to be somewhere between these alternative futures.

At the time of writing this report, there is still significant uncertainty in how cities and their public transport systems intend to move forward.

Finally, we have scaled the results from these model cities to cover all C40 cities, to give a sense of the potential public transport-related GHG and job benefits across the C40 city network.

This scale-up exercise assumes a correlation between GHG emission reductions and job creation. In reality, however, because of the significant variations in city context, there will be variations in GHG-emission and job impacts from city to city. Ideally, an analysis such as this would use local or regional data for all C40 cities to estimate more accurately the individual 1.5°C emission trajectories, associated investment costs and job creation opportunities. The results are, therefore, an illustration of the potential benefits, not a precise estimate.

5.3 A 1.5°C Pathway

C40 cities have adopted Climate Action Plans (CAPs) setting out how they will meet the commitments of the Paris Agreement. This includes public transport investment over the next decade to meet a 1.5°C pathway – the only climate safe pathway.

Our research demonstrates that the Public Transport Neglect scenario would shift us further away from the trajectory we need to be on to meet the ambition of the Paris Agreement.

A Public Transport Neglect scenario would increase GHG emissions in all four typologies compared to a BAU scenario and make it significantly more difficult for cities to meet their 1.5°C-compliant emissions targets. In contrast a Green Recovery scenario sees emissions from urban transport cut by over half.

- High GDP, High Private Vehicle Use model city: Transport emissions would be 71% lower under a Green Recovery scenario compared to a Public Transport Neglect scenario in 2030.
- Low GDP, High Private Vehicle Use model city: Transport emissions would be 34% lower under a Green Recovery scenario compared to a Public Transport Neglect scenario in 2030.
- High GDP, Low Private Vehicle Use model city: Transport emissions would be 78% lower under a Green Recovery scenario compared to a Public Transport Neglect scenario in 2030.
- Low GDP, Low Private Vehicle Use model city: Transport emissions would be 67% lower under a Green Recovery scenario compared to a Public Transport Neglect scenario in 2030.

If cities cannot reduce their transport-related emissions, they will have to compensate by cutting emissions even more in other sectors, such as energy and buildings. This will, likely, not be possible since C40 cities already need to go over and beyond to meet their 2030 emissions reduction targets in other sectors.

This research shows a Public Transport Neglect scenario presents a risk of these cities making no gains in reducing their GHG emission by 2030.

On the other hand, a Green Recovery scenario would lead all cities to reduce their emissions from urban transport between 2020-2030 to limit the increase in global average temperatures to 1.5°C compared to pre-industrial levels. This scenario is Paris Agreement compliant and what C40 Cities have committed to deliver under the Deadline 2020 programme.

5.3.3 Job creation potential of a Green Recovery

The funding gaps represented by the Public Transport Neglect scenario risks both service reductions and industry job reductions over the next decade.

Across all C40 cities, and their supply chains, a Green Recovery is estimated to generate 4.6 million public transport jobs between 2020 and 2030.

The four model cities, where C40 has estimated the difference in job creation between a Green Recovery and a Public Transport Neglect scenario, provides a stark picture. A Green Recovery would generate between 6 and 10 times as many public transport jobs by 2030, compared to a Public Transport Neglect scenario, in three out of four model cities ("Lower GDP Lower Private Vehicle Use", "Lower GDP Higher Private Vehicle Use", and "Higher GDP Lower Private Vehicle Use"). In the "Higher GDP, Higher Private Vehicle Use" model city, the job creation potential is significantly greater as to become an outlier since a Green Recovery is estimated to generate nearly 250 times as many public transport jobs by 2030, compared to a Public Transport Neglect scenario. The reason for this is that the "Higher GDP Higher Private Vehicle Use" model city is characterised by a combination of high transport emissions, as a share of total GHG emissions, and a very low public transport mode share in 2020. These characteristics require the model city to invest in a massive expansion of public transport infrastructure between 2020-2030 to align with a 1.5°C-compliant emissions trajectory.

The types of stimulus investment C40 cities have commonly planned for in their CAPs include:

- New and improved segregated Bus Rapid Transit (BRT) systems, with faster, more frequent services, more comfortable buses, and safer, more accessible stations
- New and improved metro, commuter rail and light rail with faster, more frequent services, new trains, and safer, more accessible stations
- Electric ferry services
- Investment in electric bus fleets
- Upgrading micro and paratransit to cleaner vehicles, including electric minibuses
- Electric vehicle fleet charging infrastructure

- Integrated ticketing and real time information systems

Investment in public transport would also include investment in formalising existing jobs and improving livelihoods. Informal or para transit modes are particularly important in African and some Latin American cities, where they carry up to 95% of all public transport trips⁷⁶, and where informal jobs may represent up to 30-40 per cent of the total number of transport jobs⁷⁷, a green and just recovery should lead to job formalisation through government investment linked with strong labour rights, employment standards and training.

5.3.4 Health and Air Quality Impacts

The increase in private car trips resulting from the Public Transport Neglect scenario would result in increased air pollution in all cities compared to a Green Recovery.

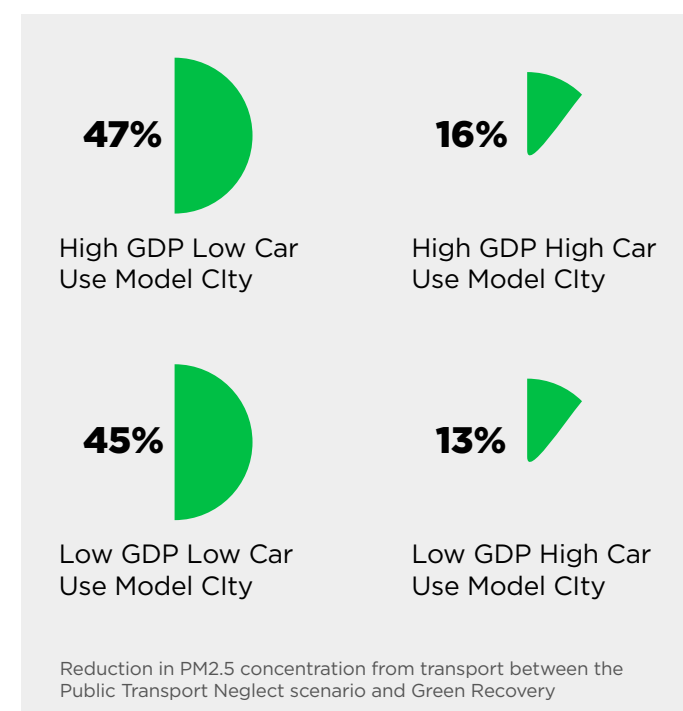
It is therefore essential to encourage a mode shift from private vehicles to public transport – along with walking and cycling – as well as encouraging the electrification of the public transport fleet to improve air quality.

A public transport neglect scenario could increase total PM2.5 air pollution concentration by up to five per cent in the four modelled cities.

The Green Recovery can reduce air pollution coming from transport by 45 per cent in cities with low private vehicle use and 14 per cent in cities with high private vehicle use compared to public transport neglect. A significant contributor to air quality improvements is the scale of vehicle electrification.

Air quality improvements are essential to reduce mortality and morbidity in cities where air pollution is already high. A growing number of studies show the increased risk of COVID-19 outcomes in locations with high air pollution concentrations⁷⁸. Across just the four model city

scenarios alone, between 100 to 200 premature deaths could be avoided in 2030 alone, representing USD 170 million in value of statistical life.



Public Transport mode share also improves commuters' health by increasing the number of minutes that commuters engage in daily active mobility. While cars, taxis and motorcycles bring commuters door-to-door, public transport requires a few minutes of walking to get to stations. Even a few minutes walking to or from a station on a workday commute delivers significant increases in life expectancy, and combats obesity, diabetes, strokes, cardiovascular diseases, breast and colon cancer as well as depression and dementia. Assuming 6 minutes of walking to and from transit stations under a daily work commute (24 minutes per day) could increase an average commuter's life expectancy by 4 to 10 months.

5.3.5 Ensuring inclusion and social equity

To safeguard accessibility and transport equity during the COVID-19 recovery, our research shows



that public transport frequency and capacity should not be drastically reduced⁷⁹ and fares should not be increased⁸⁰. Many marginalised populations – particularly low income populations – are disproportionately reliant on public transport compared to the rest of the population. Any decreased investment in public transport service and capital programmes as a result of COVID-19 impacts, and will continue to impact, these vulnerable populations the most. Youth, essential workers, people with disabilities, women and low income populations have all been

disproportionately impacted by COVID-19 in terms of access to transportation options and jobs. These cohorts have fewer transportation options than high income populations and will rely on it in order to re-enter economic activities.

Those groups dependent on public transport rely on it to make essential trips and to perform essential jobs. These riders may have a different demand profile than traditional schedules, highlighting a mismatch between needs and transit services.

Offering affordable public transport is also crucially important for job seekers. It helps unemployed residents to access more new jobs and increases their chances of finding stable employment. If public transport service cuts become permanent, workers who can't afford other transportation options could be left stranded.

HIGHER GDP, HIGHER PRIVATE VEHICLES USE



Characterised by urban sprawl, with a low share of public transport and private vehicle use at 40 per cent or greater. This city's GDP per capita at US\$25,000 or greater, and has a relatively carbon-intensive grid. Such a city is typical in North America, and shares characteristics with Auckland, Dubai, Sydney, Venice and Rome.

MASS TRANSIT NEGLECT SCENARIO

GhG Emissions:

High GDP High Car use type cities are responsible for almost half of global urban transport emissions. Research shows a Mass Transit Neglect scenario presents a risk of high car use cities making no gains on GhG emission reductions by 2030.



Transit Job Losses



Essential Workers Left

Stranded:

Essential workers may have a different demand profile than traditional schedules, highlighting a mismatch between needs and transit services. If transit service cuts become permanent, workers who can't afford other transportation options could be left stranded.



Economic Impacts:

Transit service cuts are a drag on the economy. 87% of transit trips in the US directly benefit the economy by getting people to work and connecting them to local businesses.

76% of transit operators in the US have seen a reduction in business as a result of the COVID-19 pandemic. On average, businesses have seen a 40% reduction in activity.



Mobility Implications for Marginalized Populations:

Marginalized populations have relatively higher transport expenses. In Spain, public transport authorities tried to reduce costs and increase revenues with higher fares, resulting in the poorest households increasing the share of their expenditure going on transport.



More than one in five low income households in the United States do not own a private vehicle meaning many people are completely reliant on transit to access employment, education and other opportunities in cities. Only a third of health aides that usually ride transit have access to a car, compared to more than 75% of lawyers.

Low income Black and Hispanic communities are thought to be among the hardest hit. Not only are they more exposed to the virus at work, they have poor access to health care.



Women in North America are heavy users of mass transit - most common: African, Latina and Asian.

Reduced transit investment and higher ticket prices to fill the funding gap hit the poorest and most vulnerable groups the hardest, threatening to restrict an already narrow pool of possibilities, risking higher unemployment amongst poorer communities and adding to increased inequality.

GREEN RECOVERY SCENARIO

Air Quality and Health:

↓ 16%

♥ 4.8 mos.

Reduction in PM2.5 concentration from transport between the Mass Transit Neglect scenario as compared to a Green Recover is 16%.

This shows that increasing rather than decreasing private vehicle use and car dependency has consequences for people's health.

People living in higher GDP countries may have more sedentary lifestyles and high consumption profile. Encouraging people to walk or cycle to their station has potential to reduce diseases and mortality due to the lack of activity.

The increase in life expectancy from active mobility from commuters is 4.8 months.



Improved Mobility for Marginalized Populations:

Transport policies promoting mass transit may help to limit the household transport budget and decrease the economic impacts felt by households from COVID-19. This could particularly benefit poorer households, or living in low-density areas, allowing them to reduce their transport costs.

Focusing on essential workers during the first wave of the pandemic opens up opportunities to make bus service much more reliable and frequent for those who need it most.

Job Creation

The research indicates that a Green Recovery scenario has a potential to generate as large as 249 times as many jobs as a Public Transport Neglect scenario between 2020 and 2030



City-Wide Economic Gains:

Mass Transit investment creates productivity gains long after the short-term stimulus effect. Investment in transit in the US can yield 49,700 jobs per \$1 billion invested, and offers a 5 to 1 economic return.

The Canadian Urban Transit Association estimates that every dollar invested in public transit generates \$3 in economic growth—and reclaims more of the \$15 billion in productivity we're losing each year to traffic congestion.

GhG Emissions:

By 2030, a Green Recovery scenario would reduce cities transport emissions by 71 percent in Higher GDP, Higer Private Vehicle Use model cities.



LOWER GDP, HIGHER PRIVATE VEHICLES USE



Characterised by medium density, a carbon-intensive grid mix and a low share of active transport, with private vehicle use at 40 percent or greater. GDP per capita is at US\$25,000 or less. Such a city shares characteristics with Cape Town, Delhi, Curitiba, Ho Chi Minh City and Bangkok.

MASS TRANSIT NEGLECT SCENARIO



GhG Emissions:

This research shows a Mass Transit Neglect scenario presents a risk of high car use cities making no gains on GhG emission reductions by 2030.

Transit Job Losses



Everyone has Less Mobility:

Reduced transit investment and higher ticket prices to fill the funding gap hit the poorest and more-vulnerable groups hardest, threatening to restrict an already narrow pool of possibilities, risking higher unemployment amongst poor communities and thus greater inequality.



Essential Workers Left Stranded:

Public transit in lower GDP cities are operating at less than 60% of pre-pandemic capacity since COVID-19. This makes it harder to essential workers to get to work, but also decreases good, green jobs related to transit operations.



Marginalized populations have relatively higher transport expenses. In South Africa, informal operators proposed an increase in fares of 10-25% to increase revenues in response to passenger capacity restrictions placed on them by national government. Resulting in the poorest households increasing the share of their expenditure going on transport



Women in South Africa have been heavily affected by COVID-19. They were more likely to lose their jobs and where job gains were made, they were at the back of the queue. Out of the 3 million South Africans who have lost their jobs by July 2020, two thirds were women. Overall there has been a 22% decline in the number of women employed, compared to a 10% decline in the number of men. Women are more likely to use transit than men in South Africa, being dependent on it to access work opportunities, as well as other vital services.

GREEN RECOVERY SCENARIO

Air Quality and Health:



13%



10.3 mos.

Reduction in PM2.5 concentration from transport between the Mass Transit Neglect scenario as compared to a Green Recover is 13%. This shows that providing public transport alternatives has positive benefits for citizen health outcomes.

The increase in life expectancy from active mobility from commuters is 10.3 months.



Improved Mobility for Marginalized populations:

Transport policies promoting mass transit may help to limit the household transport budget and decrease the economic impacts felt by households from COVID-19. This could particularly benefit poorer households, or those living in low-density areas, allowing them to reduce their transport costs.

Job Creation

The research indicates that a Green Recovery has a potential to generate 6 times as many jobs as a Public Transport Neglect scenario between 2020 and 2030



Economic Benefits:

Investment in public transportation expands service and improves mobility, and, can potentially affect the economy by providing reduced traffic congestion for those traveling by automobile and truck, leading to further direct travel cost savings for businesses and households.

GhG Emissions:

By 2030, a Green Recovery scenario would reduce cities transport emissions by 34 percent in Lower GDP, Higer Private Vehicle Use model cities.



LOWER GDP, LOWER PRIVATE VEHICLES USE



Characterised by medium-high density, high shares of public transport and active mobility with private vehicle use at less than 40 percent and GDP per capita at US\$25,000 or less. Typically cities in Latin America, African cities (including Durban, Johannesburg and Tshwane), South East and South West Asia, as well as China.

MASS TRANSIT NEGLECT SCENARIO

Transit Job Losses



Essential workers and Marginalized Population Left Stranded:

Evidence from Nairobi shows that the overall share of job opportunities within one hour of travel is up to five times higher for those with cars compared to those who rely on shared minibuses or must travel by foot. Threats to transit operations not only cuts off low-income households from existing jobs, but also limits their access to new opportunities, risking higher unemployment amongst poor communities, and hurting longterm economic outcomes for both the individuals and the city



1 in 4 employed women in Latin America is a domestic worker. These workers are frequently from outside of city centres, coming into the city for increased opportunity. A high percent of these domestic workers are people of colour (e.g., black, indigenous) and have lower incomes .

Public transit in lower GDP cities are operating at less than 60% of pre-pandemic capacity since COVID-19. This affects getting essential workers to and from jobs, but also decreases good green jobs related to transit operations.



Women in Nigeria are finding it difficult to travel since the COVID-19 pandemic. Public transit has decreased frequency and reliability, and the cost of informal transport is 2-3 times as much.

In Colombia, 83% of domestic workers commute to work up to 6 hrs, while 17% live at their employer's house - which means they need extra community support to take care of their children and families. During the COVID-19 pandemic, there is a shift towards more domestic workers living at their employer's house. The decreased reliability of public transit is causing significant strain on domestic workers that want to be able to work, while also taking care of their families .



GREEN RECOVERY SCENARIO

Air Quality and Health:

↓ **45%** ♥ **45.2mos.**

Reduction in PM2.5 concentration from transport between the Mass Transit Neglect scenario as compared to a Green Recover is 45%. This is a significant health impact for city dwellers.

The increase in life expectancy from active mobility from commuters is 5.2 months.



Transit Job Creation

The research indicates that a Green Recovery scenario would generate 6 times as many jobs as a Public Transport Neglect scenario between 2020 and 2030

Formalisation for a just transition

In Jakarta, investment in public transport operations included the introduction of formal employment and formal contracts with a guaranteed salary for the driver. Reducing operator reliance on fare revenues has helped decrease reckless driving, overloading and unreliable services.



Improved mobility for marginalised populations.

In Jakarta, formalising employment conditions operators by providing a guaranteed salary to each driver in exchange for following a predetermined route on a set schedule allowed the Transjakarta network to reach new areas of the city providing a better service to passengers, while drivers can focus on punctuality and safety

In São Paulo, a new line that connects a lower income neighbourhood (Campo Limpo) to a higher income neighbourhood (Brooklin) had the unforeseen benefit of decreasing the commute of domestic workers by 2 hours, which means creating an additional 40 hours of free time in domestic workers' lives every month.

GhG Emissions:

By 2030, a Green Recovery scenario would reduce cities transport emissions by 67 percent in Lower GDP, Lower Private Vehicle Use model cities.



HIGHER GDP, LOWER PRIVATE VEHICLES USE

i Characterised by medium density, with a lower share of public transport than the European average. Private vehicle use is at less than 40 percent and GDP per capita greater than US\$25,000. The grid mix is still relatively carbon-intensive. Cities are typically found in Europe, as well as cities such as Tokyo, New York, Melbourne, Sydney, Seoul, Hong Kong and Singapore.

MASS TRANSIT NEGLECT SCENARIO

GhG Emissions

This research shows a Mass Transit Neglect scenario presents a risk of cities making no gains on GhG emission reductions by 2030.



Essential Workers Left Stranded:

There has been a 12% decrease in mass transit kilometres travelled in Amsterdam, and a 6% decrease in Rotterdam. The largest reduction has been on frequent routes. No adjustments have been made to lower frequency routes.



Everyone has less mobility

Some public transport systems have aimed to provide additional frequency in order to maintain services while observing social distancing restrictions during the COVID-19 pandemic. However, due to budget concerns, agencies have reduced frequency. This makes taking public transport more difficult for everyone.



Transit Job Losses

Mobility Implications for Marginalized Populations:

Marginalized populations have relatively higher transport expenses. In Spain, public transport authorities tried to reduce costs and increase revenues with higher fares. Only the poorest households were found to increase their share of budget on transport.



Air Quality and Health:



Reduction in PM2.5 concentration from transport between the Mass Transit Neglect scenario as compared to a Green Recover is 47%.

High GDP countries may have more sedentary lifestyles and high consumption profile. Encouraging people to walk or cycle to their station has potential to reduce diseases due to the lack of activity.

The increase in life expectancy from active mobility from commuters is 4.8 months.

Transit Job Creation

The research indicates that a Green Recovery scenario would generate 10 times as many jobs as a Public Transport Neglect scenario between 2020 and 2030.



Improved Mobility for Marginalized Populations:

Poorer households, or those living in low density areas, are least able to reduce their transport costs. This means transport policies promoting public transport may help to limit the household transport budget and decrease the economic impacts felt by households from COVID-19.

Focus on location-specific essential workers during the first wave of the pandemic opens up opportunities to make bus services much more reliable and frequent for those who need it most.

GREEN RECOVERY SCENARIO



City-Wide Economic Gains:

Mass Transit investment creates productivity gains long after the short-term stimulus effect. Investment in transit in the US can yield 49,700 jobs per \$1 billion invested, and offers a 5 to 1 economic return.

The Canadian Urban Transit Association estimates that every dollar invested in public transit generates \$3 in economic growth—and reclaims more of the \$15 billion in productivity we're losing each year to traffic congestion.

GhG Emissions:

By 2030, a Green Recovery scenario would reduce cities transport emissions by 78 percent in Higher GDP, Lower Private Vehicle Use model cities.



CHAPTER 6

CONCLUSION: INVEST IN PUBLIC TRANSPORT FOR A GREEN AND JUST RECOVERY



6.1 The only stimulus should be green stimulus

National governments and international institutions should ensure a green and just recovery by stipulating that all stimulus packages, financial support to businesses and other recovery funds support the transition to a zero carbon future.

We need to prioritise investment in sustainable, climate-resilient industries and infrastructure.

A green recovery is also one that is equitable and just. An investment in public transport will help people get back to work and protect the health of urban residents, while providing opportunities to the most vulnerable and marginalised communities. Unless our recovery from the COVID-19 pandemic stimulates a rapid and irreversible shift to a zero-carbon economy, we will simply be creating a more devastating crisis in the form of climate breakdown.

Specifically, financial support should be conditioned on compliance with science-based targets for emission reductions and transition plans aligned with the Paris Agreement.

6.2 Commit to an equitable and inclusive recovery

Frontline communities have been disproportionately affected by the pandemic, including essential workers in both the formal and informal economies. Women, globally, and particularly in development and humanitarian settings, who are more likely to work in informal or low-paid jobs have been affected particularly severely. These jobs are most prone to disruption during public health emergencies¹²⁰ and the income of these groups are likely to recover slower than the other workers¹²¹.

Stimulus investment and recovery funds must be used to create more just and inclusive societies

and communities. They should directly address long-standing inequalities and ongoing discrimination affecting marginalised and discriminated ethnic and gender groups and communities living in informal settlements. As women are often more reliant on public transport than men, gender impact assessments and gender responsive assessment criteria, designed through dialogue and engagement can support better outcomes.

Plans and investment for the recovery need to help address some of the root causes of economic inequality along with equal employment opportunities in the low carbon transition. Opportunities for training and re-training should support transition. This can especially address inequality in marginalised groups by developing appropriate regularisation mechanisms which provide better employment conditions and social protections for informal workers.

6.3 Protect and champion public transport

It is essential to invest in, subsidise and support affordable, zero-emission public transport.

Public transport is the engine of sustainable mobility and yet, worldwide, it is under significant strain due to funding gaps from lost fare revenues since the COVID-19 pandemic. To keep our air clean and prioritise the health of our city dwellers, governments must use stimulus funds to make public transport more accessible, reliable, frequent, affordable, well integrated, safe and resilient to future crises.

6.3.1 Public transport funding for resilience and equity

Support for operational costs is needed now to protect the jobs of public transport workers and secure a service that is vital for essential workers – as well as for people accessing education, healthcare services and food.

The current crisis has made clear the weaknesses and instability in some forms of public transport financing. There is a need to consider which kinds of financing – for existing operations as well as investment in new and better public transport – could guarantee resilience and deliver better outcomes for jobs, decent work and equity.

One starting point would be to consider how we view public transport services. Is public transport just another product that primarily benefits those who use it, and who might reasonably be expected to cover most or all of the costs, similar to other commercial goods like food or clothes? Or is it a basic public service that everyone benefits from, as essential to a thriving city as its streets or primary education which therefore should be subsidised in large part by tax revenues?

6.3.2 Covering the costs of operations

The public transport systems with some of the smallest deficits and facing the lowest level of threat are those with a diverse revenue base. These include systems where a large proportion of costs are subsidised through general or dedicated taxation, or through reliable commercial revenues like rental income. By contrast, systems heavily dependent on fares to cover operating costs face a bigger problem. These include, a lot of informal public transport, but also even major cities like London.

Raising fares to fill the funding gap would have serious consequences for people with lower incomes¹²². These are people whose expenditure on transportation is already high – up to almost 60 per cent of their household income. In cities where housing markets result in people on lower incomes travelling further to find affordable housing, distance-based fares can result in inequitable distributions of costs and benefits. Reducing the proportion of costs covered by fares and increasing the proportion coming from more progressive sources of revenue, along with

flat fares and targeted discounts for those most in need, might provide a solution.

Fare free public transport can at first sight appear to be an attractive proposition. In certain circumstances it could be the right approach. However, evidence suggests that while usage increases in systems without fares, most of the increase comes from reduced walking or cycling, or from people making more trips overall¹²³. The impact on vehicle kilometres and therefore on emissions and air quality can be very small. In some cities it could turn out to be a subsidy for high income people with good access to private or public transport at the expense of lower income people living in locations with poorer access to public transport.

6.3.3 Stable, predictable funding for more and better public transport

If we are to view public transport as a public service rather than a commercial product, it should be designed to achieve a broader range of societal outcomes than just maximising ridership and fare revenue.

Exactly what priority each of these other outcomes have will depend on local political values and needs. However, they are likely to include:

- improving access to opportunities
- reducing emissions
- creating decent jobs
- increasing “fairness” – be that the distribution of costs and benefits between different groups or parts of the city, affordability, transparency, a “polluter pays” or “benefiter pays” principle, or some combination of these.

There is no “one-size-fits-all” funding model. The right mix of funding sources for public transport should also take account of the outcomes and as far as possible support them. For example, revenue sources that encourage mode shift from private cars, like fuel taxes or congestion charges, could contribute to increased accessibility through lower congestion and emissions

reduction. Some revenue sources will lead to a greater redistribution of resources that favour those with the least resources.

6.3.4 Public transport is just one part of a larger mobility system

For a truly stable and sustainable funding model, it is important to consider the role of public transport in the broader transportation system.

The funding of the road network is, in many jurisdictions, heavily dependent on fuel taxes. As electrification of road transport accelerates, this revenue stream is becoming more unstable and in the medium term is set to decline. This, therefore, presents an opportunity to review all transportation funding to ensure it supports broader transportation objectives.

Switzerland is developing a concept called mobility pricing. This model takes several existing taxes and fees for driving and for public transport, before rationalising them to create a distanced-based charge for travel for all domestic travel¹²⁴.

This model would achieve several goals, in-

cluding:

- a more transparent system of charges and taxes
- a stable source of revenues; reduced congestion in urban areas
- reduced emissions of greenhouse gases

The intention is that travellers would not in total pay any more, just pay differently.

Other jurisdictions are considering a concept known as Universal Basic Mobility¹²⁵ or Mobility Accounts that could connect a form of mobility pricing to a system of caps, rebates, exemptions and discounts to support access for people on low incomes or vulnerable in other ways.

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